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ABSTRACT

Distance learning involves students and faculty engaged in interactive instructional settings when they are at different locations. Compressed video is the live transmission of two-way auditory and visual signals at the same time between sites at different locations. The use of compressed video has expanded in recent years, ranging from use by the government and commercial users to post-secondary institutions and K-12 schools. Compressed video was first used at Nova Southeastern University (NSU) in the summer of 1994, and has been expanded to become a regular part of the faculty's teaching repertoire. The initial use, involving a three-site, week-long workshop at the master's level, is described in detail. Following this successful initial use, a series of classes were scheduled between sites in Florida, Arizona, and Nevada, using compressed video equipment only a few hours per week, supplemented with voice communication and electronic mail. Examples of the current use of compressed video in other academic programs at NSU are provided, and justification for the selection of a particular vendor is given. (MAS)

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"Compressed Video: An Interactive Tool to Encourage Students to Accept Distance Learning as an Alternative to Face-to-Face Instruction"

A Presentation for the 12th International Conference on Technology and Education (ICTE)

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

COMPRESSED VIDEO: AN INTERACTIVE TOOL TO ENCOURAGE STUDENTS TO ACCEPT DISTANCE LEARNING AS AN ALTERNATIVE TO FACE-TO-FACE INSTRUCTION

Al P. Mizell*, Toni Heppler+ and George Kontos•

Background

Distance learning involves students and faculty engaged in interactive instructional settings when they are at different locations. Compressed video is the live transmission of two-way auditory and visual signals at the same time between sites at different locations. An encoder/decoder (codec), camera, etc. must be present at each location. The signals can be sent over special phone lines (optical fiber, ISDN or switch 56 lines) or by satellite or microwave at a lower cost than full-motion two-way video that requires more expensive bandwidth transmission modes.

Normal video signals are transmitted at a rate of 30 frames/second. This requires a lot of memory and bandwidth. However, by sending signals that change only 10 to 15 times/second and then compressing the video signals in an encoder, they can be sent over less expensive lines. At the receiving end, the signals are then decoded to return them to their original 10 to 15 frames per second. The resulting picture is not as smooth as full motion video but it is quite clear and viewers generally adjust to it with no problems within their first 15 minutes on the system.

It should be noted that compressed video units generally reserve at least half of their band-width for the audio portion because they report that research has confirmed that the majority of student learning

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comes from the audio message and not from the visual. We like the visual images but we evidently rely more on the sound than we do on what we see. This may, of course, vary by the preferred learning styles of each learner.

Uses of compressed video

The use of compressed video has expanded significantly in recent years. The military, businesses, and education have found that it is less expensive to bring training to distance locations and to schedule meetings at a number of locations at the same time using compressed video than it is to fly individuals to a central location. Uses in education that have been described in the literature range from use by the government and commercial users to post-secondary institutions and to K-12 schools. An example is the use of compressed video to connect a classroom in a small grade 7-12 school with another classroom in a large 9-12 school. Some courses originate at one site and other courses originate at the other site. For example, French I and II, calculus, bookkeeping, psychology, and health have been taught between these two schools. Many additional examples are presented as brief case studies in the Aect publication: *Compressed Video: Operation and Applications* (1993) by Hakes, Sachs, Box, and Cochenour.

Use at Nova Southeastern University (NSU)

Although our first use of this technology for live teaching was in the summer of 1994, we have already expanded its use beyond the first workshop to become a regular part of our faculty's teaching repertoire. Faculty training is very important and that is being provided before teachers are asked to plan their first use of compressed video.

In the initial use of compressed video at NSU, two teachers who were new to the use of compressed video, introduced their students to it in a three-site week-long workshop at the master's level. Students were located on campus in Fort Lauderdale, in a remote location at Phoenix, and at a third site in Las Vegas. Having observed these teachers in action, it was exhilarating to see the students actively involved in these all-day classes regardless of their physical location. The teachers kept all students involved. One outstanding example was when the class broke into diads for a short exercise and a student from Ft. Lauderdale was teamed with a student in Phoenix. They did their discussions over the compressed video equipment while the other students talked with the person next to them at their own

site. When the class reconvened, each group gave its report, including the group from Phoenix/Ft. Lauderdale! These two students were able to work together in the same way they would have done if they had actually been in the same location.

Use of the document camera for close-ups of drawings and papers gave students at all sites, a clear view of material that would normally be seen on a transparency or objects that could not have been easily seen by all students. VCR players, videodisc players, computers, white boards, etc. can be connected to the compressed video unit so the visual material (and sound) can be seen (and heard) by all participants on their PictureTel monitors.

Following this highly successful initial use of the technology, a series of classes were scheduled between sites in Florida, Arizona, and Nevada. In these classes, only a few hours each week were spent online using the compressed video equipment. Other methodologies were used for part of the course delivery. This is a much more economical use of the technology. Using the video component when that is most appropriate enables students to use voice if that is best or the computer screen and a modem if that is the best way to achieve that set of objectives.

Since these initial uses in the master's classes, other programs have made use of the technology. Uses at NSU have ranged from bringing a guest speaker on adult learning theory from Phoenix to an auditorium full of college teachers in the medical school in South Florida to a staff meeting where one of the members was in a rented facility in Atlanta while the rest of the team was around a table in Ft. Lauderdale. The TV monitor became a fully participating member of the meeting with the participants almost unaware of the fact that one of their colleagues was sitting in a room many hundreds of miles away.

During the presentation today, the best way to see how effective compressed video can be is to see it in action. So we have tried to arrange a demonstration of the technology for you. However, we have a videotape from PictureTel as a back-up in case we are not able to make the phone line connection we would like. In case you wonder why NSU selected PictureTel from the three main suppliers of compressed video, there are at least two reasons. We investigated a number of vendors and found that PictureTel had a majority of the market, they had a local vendor to give us immediate support, the local phone company was used to working with them, they had both the international standards and their own (improved) techniques for compressing and expanding the images that were especially clear, and they supported a users group with annual meetings where we could

interact with colleagues on ways to improve our use of the system. The PictureTel Users Group (PUG) now has a SIG for education and they are establishing a listserv through NSU to carry on regular discussions and to help facilitate the sharing of information and experiences. Users of other vendors have expressed satisfaction with their choices so each user has to investigate and select the vendor that best meets their particular needs.